HOYT RANCH (1280288)
SOURCE WATER ASSESSMENT DRAFT REPORT

June 28, 2004

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of this designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for Hoyt Ranch (PWS #1280288)* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, e.g. nitrates, arsenic), volatile organic contaminants (VOCs, e.g. petroleum products), synthetic organic contaminants (SOCs, e.g. pesticides), and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The Hoyt Ranch drinking water system consists of four wells: Well #1, Well#2, Well #9 and Well #10. Water chemistry tests are routinely conducted on the wells of the Hoyt Ranch drinking water system. Microbial detections have previously been detected at the pump house, wellhead, and through the distribution system. Pump house samples had microbial detections on 7/26/00, 9/13/00, 7/1/03, and 7/3/03. Well #10 had a microbial detection at the well head on 7/8/03. Follow-up testing on 7/12/03 and 7/29/03 showed no microbial detection for Well #10. Multiple other detections have been reported throughout the distribution system, including detections at the Ranch sampling point (sample ID # DS 5-TC) on 1/21/03, the Upstream sampling location on 7/26/00, the Hoyt Bluff sampling location on 7/26/00, the P.line Trail sampling location on 8/30/00, 9/4/00, 9/13/00, and 9/28/00, and the Hoyt Road sampling location on 9/13/00 and 9/28/00. These detections were identified by searching the Idaho State Drinking Water Information System (SDWIS) database. Since the most recent detections in July of 2003, the Hoyt water system has installed chlorinating and anti-siphon systems to help reduce the potential for future microbial detections. Nitrate concentrations have not been detected in the samples collected. No IOC contaminants have been detected in any of the samples collected from the system though the potential from the nearby transportation corridor and river remains high. The county wide nitrogen fertilizer usage ranked high for this system, which also increases the potential for contamination. In terms of total susceptibility, the Hoyt Ranch rated moderate for IOC, SOC, VOC, and microbial contamination, with the exception of well #10 that rated high for microbial contaminants.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the Hoyt Ranch, drinking water protection activities should focus on continuing to maintain the requirements of the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Any spills from the potential contaminant sources listed in Table 1 of this report should be carefully monitored, as should any future development in the delineated areas. Most of the designated areas are outside the direct jurisdiction of the Hoyt Ranch. In addition, drinking water protection activities should focus on implementation of practices aimed at reducing the microbial detections that have persistently been detected within the distribution system Partnerships with state and local agencies and industry groups should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land use areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the State Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission and Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed drinking water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Coeur d' Alene Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR HOYT RANCH, POST FALLS, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop this assessment is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments for sources active prior to 1999 were completed by May of 2003. SWAs for sources activated post-1999 are being developed on a case-by-case basis. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Hoyt Ranch, near Post Falls, Idaho is located approximately three and half miles north of the town of Post Falls. Highway 53 runs just south of the source wells and a line from the Burlington Northern Railroad also runs just south of the source wells (Figure 1). The public drinking water system for Hoyt Ranch is comprised of four wells and serves approximately 55 people through 38 connections.

Water chemistry tests are routinely conducted on the Hoyt Ranch drinking water system. Microbial detections have previously been detected throughout the distribution system. Pump house samples had microbial detections on 7/26/00, 9/13/00, 7/1/03, and 7/3/03. Microbial detections were measured at the well head of well #10 on 7/8/03. Multiple other detections have been reported, including detections at the Ranch sampling point (sample ID # DS 5-TC) on 1/21/03, the Upstream sampling location on 7/26/00, the Hoyt Bluff sampling location on 7/26/00, the Pauline Trail sampling location on 8/30/00, 9/4/00, 9/13/00, and 9/28/00, and the Hoyt Road sampling location on 9/13/00 and 9/28/00. Nitrate concentrations have not been detected in the samples collected. No IOC contaminants have been detected in any of the samples collected from the system though the potential from the nearby transportation corridor remains high.

Defining the Zones of Contribution--Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) time-of-travel (TOT) for water associated with the Rathdrum Prairie aquifer in the vicinity of the Hoyt Ranch. The computer model used site specific data, assimilated by DEQ from a variety of sources including the Hoyt Ranch well logs and other local area well logs, and hydrogeologic reports summarized below. The delineated source water assessment area for Hoyt Ranch can best be described as a two-mile wide ellipse shaped zone that extends to the northwest of the source wells approximately six miles. The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

Hydrogeology

The Hoyt Ranch Water system is located in north central Idaho, near the Idaho-Washington state line. The wells are located just north of the city of Post Falls, as seen in Figure 1. The Spokane River flows approximately four miles to the south of the wells. Hauser Lake is located approximately one mile to the west of the well field. Based on the past 50 years of data from a nearby weather station, the area experiences 17.8 inches of precipitation per year (Weatherbase, 2003).

Based on well log information and local geologic maps, the source wells are completed in granite. Alluvial fill and topsoil are encountered in the upper portions of each well, but the granitic rocks produce the water available to these wells.

The ground water in this intrusive unit is found in decomposed areas within the formation or through open fracture flow in the fracture network within this unit. The location and depth of water producing zones within this type of aquifer is highly variable, and often do not correlate spatially with distance.

The regional aquifer in the area, the Rathdrum Prairie aquifer is located adjacently south of the well field. The wells are completed in the foothills of granites that make up Mount Spokane. These granitic uplands form the northern boundary for the Rathdrum Prairie aquifer. These uplands also serve as a recharge area for the Rathdrum Prairie aquifer as the general ground water flow direction in these foothills is to the south.

The capture zones for the source wells were delineated using the WhAEM Model 2000, version 1.0.4. The model was run by inputting hydrogeologic data of the study area obtained through geologic maps, well logs, topographic maps, and previous investigations. Boundary conditions and initial aquifer parameters were estimated and inputted into the model. The model was then run over a series of simulations where aquifer parameters and model boundaries were adjusted to simulate a "best fit" scenario.

Boundary conditions used in the model were obtained from geologic maps and hydrogeologic knowledge of the area. The wells are completed in the granitic uplands that bound the alluvial Rathdrum Prairie aquifer. Surface water bodies, model domain boundaries, and constant head boundaries were all investigated through the modeling process.

Hauser Lake, a surface water body located on the granitic foothills, is the most prominent boundary condition within the study area. This lake was modeled as a constant flux boundary, with variable discharge rates inputted into the model. The negative flux associated with this water body was selected due to the elevations of the lake and surrounding wells. The water levels in the surrounding wells are all significantly lower than the elevation of the lake, indicating the lake is potentially recharging the aquifer within the foothills. The flux of this boundary was adjusted throughout the modeling process, and the value used for the "best fit" scenario can be seen below.

The Rathdrum Prairie aquifer is recharged from the granitic foothills in which these wells are located. Due to the hydrogeologic nature of the Rathdrum Prairie aquifer, the boundary between the granitic uplands and the alluvial aquifer was modeled as a constant head boundary. The Rathdrum Prairie has been intensively investigated, with known head conditions and flow directions. Therefore, based on ground water flow maps of the aquifer, constant head elevations were selected. A no flow boundary was arbitrarily placed around the outer edges of the study area to limit the size of the area incorporated into the model domain.

The model was run with the initial estimates of the aquifer data and model boundary conditions. The model was run over a series of simulations to approximate the "best fit" parameters for the simulation of the capture zones. For this particular study, the "best fit" parameters were as follows:

Aquifer base elevation (ft amsl):	1300
Aquifer thickness (ft):	32.5
Hydraulic conductivity (ft/day):	1
Recharge rate (ft/year):	0.001
Porosity:	0.15

The aquifer base elevation was estimated from the well log information and a topographic map. The aquifer thickness was approximated from the well log information. Due to the wide variability of the screened intervals and production zones, an average was computed to best estimate the aquifer thickness. The recharge rate was estimated at 25% of the total precipitation received in the area. The porosity was assigned a value of 0.15. Pump tests conducted on these wells have resulted in various hydraulic conductivity values. Therefore, estimates were originally entered into the model and the hydraulic conductivity of the aquifer was adjusted until the most reasonable test point match was achieved.

Due to the heterogeneity of the aquifer, test point matches were limited. In addition, locations and elevations of the wells used as test points were taken from the well logs and a topographic map. This vague locating practice allows test point matches to be acceptable if they are within 50 feet. With the increased complexity due to the heterogeneity of the aquifer, the test point matches could not be constrained to the usual acceptability.

The flux value assigned to the Hauser Lake boundary was a notable parameter for these simulations. The model was run without the boundary incorporated, low flux values (0 ft^2/day) to high flux values (-10 ft^2/day) to observe the influence of this boundary on the model results. Results from the various simulations can be seen in the attached figures. The most representative flux used in the "best fit" simulation was approximated at –1 ft^2/day. The figure delineating the capture zone is a composite of the various simulations.

The pumping rates of the source wells were estimated from well logs and pumping records of the facility. The pumping rates of the modeled wells were entered into the model as 1.5 times the reported rate. This increase in pumping rate acts as a factor of safety for all simulations run. Well #1 was modeled at a pumping rate of 30,802 ft^3/day. Well #2 was modeled at a rate of 14,439 ft^3/day. Well #9 was modeled at a rate of 10,829 ft^3/day. Well #10 was modeled at a rate of 13,476 ft^3/day. All four wells were simulated at the same time to represent the interference of the cones of depression.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside the Hoyt Ranch is wooded rangeland. Land use within the immediate area of the wellhead consists of wooded rangeland.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release.

Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local,

state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted during April 2004. The inventory involved identifying and documenting potential contaminant sources within the Hoyt Ranch Source Water Assessment Area through the use of computer databases and Geographic Information System maps developed by DEQ. An enhanced contaminant inventory was conducted by sending the operator of the system the Potential Contaminant Inventory information to be confirmed or updated. No additional sources or changes were identified by the operator.

Ten potential contaminant sites are located within the delineated source water area (Table 1). The sources are a general contractor, a fire protection service, an automotive repair facility, a manufacturing plant, a fabrication plant and two gravel pits that are all located within the 0 to 3 year time-of-travel (TOT) zone. A machine shop is located within the 3 to 6 year TOT zone. Highway 53 and a line of the Burlington Northern railway system are located within the delineated area that create additional potential contaminant sites.

Table 1. Hoyt Ranch, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	General Contractor	0-3	Database Search	IOC, VOC, SOC
2	Fire Protection Service	0-3	Database Search	VOC, SOC
3	Automotive repair	0-3	Database Search	IOC, VOC, SOC
4	Manufacturing plant	0-3	Database Search	IOC, VOC, SOC
5	TRI site	0-3	Database Search	IOC, VOC, SOC
6	Mine	0-3	Database Search	IOC, VOC, SOC
7	Mine	0-3	Database Search	IOC, VOC, SOC
8	Machine Shop	3-6	Database Search	IOC, VOC, SOC
	Burlington Northern Railroad	0-3	GIS Map	IOC, VOC, SOC, Microbial
	Highway 53	0-3	GIS Map	IOC, VOC, SOC, Microbial

[1] TRI = Toxic Release Inventory Site
[2] TOT = time of travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity was high for wells #1, #2, and #10 (see Table 2). The hydrologic sensitivity of well #9 was moderate. The high ratings for wells #1, #2, and #10 are due to the ground water being shallower than 300 feet bgs. There is a lack of low permeability units with a cumulative thickness of 50 feet to impede the downward migration of surface contaminants, except for well #9, which decreased the ranking from high to moderate for this well. The soils in the delineated area are classified as moderately to well drained soils and the nature of the materials composing the vadose zone is fractured bedrock.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The Hoyt Ranch drinking water system consists of four wells that extract ground water for domestic uses. The well system construction score was moderate for Wells #9 and #10. Wells #1 and #2 rated low in terms of system construction. The ratings are due to the thickness requirement imposed by IDWR on casing construction not being met for wells #1 and #2. Sanitary surveys have not been

conducted since the development of wells #9 and #10, but proper documentation has been provided to confirm the proper annular seals are in place. However, wells #9 and #10 had increased system construction scores due to the annular seals of the wells not extending into a low permeable unit. Well #2 rated low due to the highest production zone being more than 100 feet lower than the static water level. No significant deficiencies were noted within the sanitary surveys.

Well #1 is a 300 foot deep well drilled in 1999. The well is cased with 0.250-inch thick, 8 inch steel casing down to 59 feet into granite, and cased with a six inch PVC casing from 14 to 280 feet into granite. The well's open interval is from 200 to 300 feet, with perforations in the casing between 200 to 280 feet. The surface seal of the well was developed out of bentonite to a depth of 59 feet bgs into granite. The well is equipped with a 7.5 HP submersible pump set at 260 feet. Production records of this well indicate the well is capable of yielding 80 gpm. The static water level in the well is approximately 45 feet below ground surface (bgs).

Well #2 is a 520 foot deep well drilled in 1999. This well is cased to a depth of 500 feet with 0.160-inch thick, 6 inch PVC casing, with perforations from 400 to 500 feet. The bottom 20 feet of the well are open to the aquifer. The surface seal of the well was developed out of bentonite to a depth of 39 feet bgs into granite. Well #2 is equipped with a 5 HP submersible pump set at a depth of 470 feet. The well was tested at a yield rate of 50 gpm. The static water level in the well is approximately 45 feet bgs.

Well #9 is a 700 foot deep well that was drilled in 2003. This well is cased with 0.322-inch thick, 8 inch steel casing to a depth of 102 feet. The remaining 600 feet of the well is open to the formation. The surface seal of the well was developed out of bentonite to a depth of 20 feet bgs into fine sand and gravel. This well is a low yielding well, tested at 7.5 gpm and 35 gpm. The pumping rate at which the water level was able to stabilize was 11 gpm. The static water level in this well is unknown.

Well #10 is a 500 foot deep well that was drilled in 2003. This well is cased to a depth of 500 feet with 0.200-inch thick, 4 inch PVC casing. The well is screened from 465 to 500 feet bgs. The surface seal of the well was developed out of bentonite to a depth of 24 feet bgs into sand and gravel. The well is a low yielding well, tested at 7 gpm and 35 gpm. The pumping rate at which the drawdown in the well stabilized was 11 gpm. The static water level in this well is approximately 95 feet bgs.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Table 1 of the *Recommended Standards for Water Works* (1997) states that 8-inch steel casing requires a thickness of 0.322 inches, instead of the 0.250 inches that was used on wells #1 and #2. The standards state that screens will be installed and have openings based on sieve analysis of the formation. Standard 3.2.4.1 requires all PWSs to have yield and drawdown tests that last "24 hours or until stabilized drawdown has continued for six hours at 1.5 times" (Recommended Standards for Water Works, 1997) the design pumping rate.

Potential Contaminant Source and Land Use

The wells rated moderate for IOCs (e.g. nitrates), SOCs (e.g. pesticides), and VOCs (e.g. petroleum products). These ratings reflect the numerous potential contaminant sources located within the delineated area. In addition, the county level nitrogen fertilizer use was rated high. The delineated source area also intersects a major highway and railroad track that contributed to the rating of the system. Wells #1, #2, and #9 rated low for microbial contaminants. Well #10 rated high for microbial contaminants. This high rating is due to the presence of bacteria contaminants detected at the well head. This detection creates an automatic high ranking for microbial contaminant susceptibility.

Final Susceptibility Ranking

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, the storage or application of any potential contaminants within 50 feet of the wellhead will lead to an automatic high score. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) contribute greatly to the overall ranking. In terms of total susceptibility, all of the Hoyt Ranch wells rated moderate susceptibility to IOC, VOC, SOC, and microbial contaminants (Table 2), with the exception of well #10. Well #10 rated moderate for all contaminants except microbials, which was rated high due to microbial detections present at the well head on 7/8/03.

In terms of total susceptibility, the wells ranked moderate for IOCs, VOCs, and SOCs. The total susceptibility for microbials was rated moderate for wells #1, #2, and #9. Well #10 was rated high in terms of microbial susceptibility due to the microbial detection on 7/8/03. The ratings are predominantly caused by the high hydrologic sensitivity and the potential contaminant sources located within the delineated area. Also, the presence of bacteria detections at the well head of well #10 contributed to the high microbial rating.

Table 2. Summary of Hoyt Ranch Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
1	H	M	M	M	L	L	M	M	M	M
2	H	M	M	M	L	L	M	M	M	M
9	M	M	M	M	L	M	M	M	M	M
10	H	M	M	M	H	M	M	M	M	H

[1]H = High Susceptibility, M = Moderate Susceptibility, Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

The wells showed a moderate susceptibility to IOCs, VOCs, SOCs and microbial contamination from nearby potential contaminant sources, with the exception of well #10, which received a high rating for microbial contamination. The river and highway that intersect the delineated area also contribute to the overall ranking of the system.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the Hoyt Ranch, drinking water protection activities should focus on implementation of practices aimed at reducing the microbial detections that have persistently been detected within the distribution system. The Hoyt Ranch should also be diligent about local businesses that are regulated by the various environmental regulations (RCRA, CERCLA, SARA) or those with potential inorganic contaminants (see pg. 16 for additional information). Most of the designated areas are outside the direct jurisdiction of the Hoyt Ranch. Partnerships with state and local agencies and industry groups should be established and are critical to success. Disinfection practices should be maintained to reduce the risk of microbial contamination. Continued vigilance in keeping the well protected from surface flooding can also keep the potential for contamination reduced.

Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land use areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations, therefore the State Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho Department of Agriculture, the Soil Conservation Commission and Kootenai Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Coeur d' Alene Regional DEQ Office	(208) 769-1422
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (mlharper@idahoruralwater.com) for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho State Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Weatherbase, 2003. Online climate database website at weatherbase.com.

Attachment A

Hoyt Ranch
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Public Water System Name:	Hoyt Ranch
Public Water System Number:	1280288
Well Number:	1
Date:	4/9/2004
Person Conducting Assessment:	Dennis Owsley

SWA Susceptibility Rating Sheet

Zone IA Susceptability Rating

Warning: Due to specific conditions found in Zone IA this well has been assigned a High overall susceptability for: None

This rating is based on: (1)The presence of contaminant sources in Zone IA or (2)The detection of specific SOC/VOC chemicals in the well or (3)The detection of specific IOC chemicals above MCL levels in the well.

Public Water Systems may petition IDEQ to revise susceptibility rating based on elimination of contaminant sources or other site-specific factors.

Community and Noncommunity-Nontransient Sources	IOC Score	SOC Score	VOC Score
Hydrologic Sensitivity Score =	6	6	6
Potential Contaminant Source/Land Use Score X 0.20 =	3	3	3
Source Construction Score =	1	1	1
Total			

	Public Water System Name:	Hoyt Ranch					Version 2.1
	Public Water System Number:	1280288					5/19/1999
	Well Number:	1					
	Date:	4/9/2004					
	Person Conducting Assessment:	Dennis Owsley					
	Source Construction Worksheet						
							Comments
(1)	Well Drill Date	Input Date	February 10, 1999				
(2)	Well Drillers Log Available?	(•) Yes	( ) No				If no well log is available answers to (4) and (6) are assumed to be NO and points are added to score.
				Year			
(3)	Sanitary Survey Available? If Yes, for what year?	(•) Yes	( ) No	2000			If no sanitary survey is available answer to Questions (5) and (8) is assumed to be NO and points are added to score.
					Value		
(4)	Are current IDWR well construction standards being met?		( ) Yes (•) No		1		A thickness requirement of 0.0322 inches is required on 8 inch diameter wells. The well log indicates a 0.025 inch thick casing was used.
(5)	Is the wellhead and surface seal maintained in good condition?		(•) Yes ( ) No		0		Determined from the sanitary survey.
(6)	Do the casing and annular seal extend to a low permeability unit?		(•) Yes ( ) No		0		The casing extends into granite.
(7)	Is the highest production interval of the well at least 100 feet below the static water level?		(•) Yes ( ) No		0		The highest production interval is 250 -253 feet bgs, taken from the well log. The static water level was 45 feet bgs.
(8)	Is the well located outside the 100 year floodplain and is it protected from surface runoff?		(•) Yes ( ) No		0		Taken from the sanitary survey and the PCI.
		Source Construction Score =			1		
	Final Source Construction Ranking =	Low Source Construction Score (0 to 1 point)					

Public Water System Name: Hoyt Ranch — Version 2.1

Public Water System Number: 1280288 — 5/19/1999

Well Number: 1

Date: 4/9/2004

Person Conducting Assessment: Dennis Owsley

Potential Contaminant Source/Land Use Worksheet

	Land Use/Zone IA		IOC Score	VOC Score	SOC Score	Microbial Score	Comment
(1)	Land Use (Pick the Predominant Land Type)	Rangeland, Woodland, Basalt	0	0	0	0	Determined from the PCI
(2)	Is Farm Chemical Use High or Unknown? (Answer No if (1) = Urban/Commercial)	(•) Yes ( ) No	Complete Step 2a				Determined from the PCI
2a	Indicate approriate chemical category	[x] IOCs [ ] VOCs [ ] SOCs	2	0	0	0	
(3)	Are IOC, VOC, SOC, Microbial or Radionuclide contaminant sources Present in Zone IA? OR Have SOC/VOC contaminants been detected in the well? OR have IOC contaminants been detected above MCL levels in the well? If Yes, please check the appropriate chemical	( ) Yes (•) No [ ] IOCs [ ] VOCs [ ] SOCs [ ] Microbials					
		Land Use Subtotal	2	0	0	0	

	Zone IB			IOC Score	VOC Score	SOC Score	Microbial Score	Comment
(4)	Contaminant Sources Present in Zone IB?	(•) Yes ( ) No						
	Number of Sources in Zone IB in Each Category?	# IOC Sources	4	8	8	8	8	
	(List sources by Category up to a Maximum of Four per Category)	# VOC Sources	4					
		# SOC Sources	4					
		# Microbial Sources	4					
(5)	Are there Sources of Class II or III Leachable Contaminants in Zone IB?	(•) Yes ( ) No		IOC Score	VOC Score	SOC Score	Microbial Score	
	(List Sources up to a Maximum of Four per Category)	# IOC Sources	4	4	4	4	0	
		# VOC Sources	4					
		# SOC Sources	4					
(6)	Does a Group 1 Priority Area Intercept or Group 1 Priority Site Fall Within Zone IB?	( ) Yes (•) No [x] IOCs [ ] VOCs [ ] SOCs [ ] Microbials		0	0	0	0	
(7)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone IB.	Less Than 25% Agricultural Land		0	0	0	0	
		Zone IB Subtotal		12	12	12	8	

	Zone II			IOC Score	VOC Score	SOC Score	Microbial Score
(9)	Are Contaminant Sources Present in Zone II?	◉ Yes ○ No	Complete Step 9a				
9a	What types of chemicals?	☑ IOCs ☑ VOCs ☑ SOCs		2	2	2	0
(10)	Are there Sources of Class II or III Leachable Contaminants in Zone II?	◉ Yes ○ No	Complete Step 10a				
10a	What type of contaminant?	☑ IOCs ☑ VOCs ☑ SOCs		1	1	1	0
(11)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone II.	Less Than 25% Agricultural Land		0	0	0	0
		Zone II Subtotal		3	3	3	0

	Zone III			IOC Score	VOC Score	SOC Score	Microbial Score
(12)	Contaminant Sources Present in Zone III?	○ Yes ◉ No	Go to Step 13				
12a	What types of contaminant?	☐ IOCs ☐ VOCs ☐ SOCs		0	0	0	0
(13)	Are there Sources of Class II or III Leachable Contaminants in Zone III?	○ Yes ◉ No	Go to Step 14				
13a	What types of contaminants?	☐ IOCs ☐ VOCs ☐ SOCs		0	0	0	0
(14)	Is there Irrigated Agricultural Land That Occupies > 50% of Zone III?	○ Yes ◉ No		0	0	0	0
		Zone III Subtotal		0	0	0	0

	IOC Score	VOC Score	SOC Score	Microbial Score
Community and Non-Community, Non-Transient System Contaminant Source/Land Use Score	17	15	15	8

Final Community/NC-NT System Ranking

IOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

VOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

SOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

Microbial Score = Low Contaminant/Land Use Score (0 to 10 points)

	Public Water System Name:	Hoyt Ranch						Version 2.1
	Public Water System Number:	1280288						5/19/1999
	Well Number:	1						
	Date:	4/9/2004						
	Person Conducting Assessment:	Dennis Owsley						
	Hydrologic Sensitivity Worksheet							
							Value	Comments
(1)	Do the soils belong to drainage classes in the poorly drained through moderately well drained categories?		○ Yes	◉ No			2	The soils were rated as moderate to well drained soils.
(2)	Is the vadose zone composed predominantly of gravel, fractured rock; or is unknown?		◉ Yes	○ No			1	The vadose zone is composed of sand and gravel, decomposed granite and granite, according to the well log.
(3)	Is the depth to first groundwater greater than 300 feet?		○ Yes	◉ No			1	The first ground wate was encountered at a depth of 75 feet, in granite.
(4)	Is an aquitard present with silt/clay or sedimentary interbeds within basalt with greater than 50 feet cumulative thickness?		○ Yes	◉ No			2	According to the well log, this aquitard material is not present.
			Hydrologic Sensitivity Score =				**6**	
	Final Hydrologic Sensitivity Ranking =	High Hydrologic Sensitivity Score (5 to 6 points)						

Public Water System Name:	Hoyt Ranch
Public Water System Number:	1280288
Well Number:	2
Date:	4/9/2004
Person Conducting Assessment:	Dennis Owsley

SWA Susceptibility Rating Sheet

Zone IA Susceptability Rating	
Warning: Due to specific conditions found in Zone IA this well has been assigned a High overall susceptability for:	None
This rating is based on: (1)The presence of contaminant sources in Zone IA or (2)The detection of specific SOC/VOC chemicals in the well or (3)The detection of specific IOC chemicals above MCL levels in the well.	
Public Water Systems may petition IDEQ to revise susceptibility rating based on elimination of contaminant sources or other site-specific factors.	

Community and Noncommunity-Nontransient Sources	**IOC Score**	**SOC Score**	**VOC Score**
Hydrologic Sensitivity Score =	6	6	6
Potential Contaminant Source/Land Use Score X 0.20 =	3	3	3
Source Construction Score =	1	1	1
Total	**10**	**10**	**10**
FINAL WELL RANKING			
IOC Ranking is Moderate (6 to 12 points)			
SOC Ranking is Moderate (6 to 12 points)			
VOC Ranking is Moderate (6 to 12 points)			

Microbial Susceptability Rating	**Score**
Hydrologic Sensitivity Score =	6
Potential Contaminant Source/Land Use Score X 0.375 =	3
Source Construction Score =	1
Total	**10**
FINAL WELL RANKING	
Microbial Ranking is Moderate (6 to 12 points)	

	Public Water System Name:	Hoyt Ranch					Version 2.1
	Public Water System Number:	1280288					5/19/1999
	Well Number:	2					
	Date:	4/9/2004					
	Person Conducting Assessment:	Dennis Owsley					
	Source Construction Worksheet						Comments
(1)	Well Drill Date	Input Date	February 18, 1999				
(2)	Well Drillers Log Available?	(•) Yes	( ) No				If no well log is available answers to (4) and (6) are assumed to be NO and points are added to score.
				Year			
(3)	Sanitary Survey Available? If Yes, for what year?	(•) Yes	( ) No	2000			If no sanitary survey is available answer to Questions (5) and (8) is assumed to be NO and points are added to score.
					Value		
(4)	Are current IDWR well construction standards being met?		( ) Yes (•) No		1		The casing thickness requirements were not meant.
(5)	Is the wellhead and surface seal maintained in good condition?		(•) Yes ( ) No		0		Based on the sanitary survey.
(6)	Do the casing and annular seal extend to a low permeability unit?		(•) Yes ( ) No		0		According to the well log, the casing extends into granite.
(7)	Is the highest production interval of the well at least 100 feet below the static water level?		(•) Yes ( ) No		0		The highest production interval is at 482 to 486 feet bgs, whereas the static water level was 45 feet bgs, according to the well log.
(8)	Is the well located outside the 100 year floodplain and is it protected from surface runoff?		(•) Yes ( ) No		0		Based on the sanitary survey and the PCI.
		Source Construction Score =			**1**		
	Final Source Construction Ranking =	Low Source Construction Score (0 to 1 point)					

	Public Water System Name:	Hoyt Ranch		Version 2.1			
	Public Water System Number:	1280288		5/19/1999			
	Well Number:	2					
	Date:	4/9/2004					
	Person Conducting Assessment:	Dennis Owsley					

Potential Contaminant Source/Land Use Worksheet

	Land Use/Zone IA			IOC Score	VOC Score	SOC Score	Microbial Score
(1)	Land Use (Pick the Predominant Land Type)	Rangeland, Woodland, Basalt		0	0	0	0
(2)	Is Farm Chemical Use High or Unknown? (Answer No if (1) = Urban/Commercial)	(•) Yes	( ) No	Complete Step 2a			
2a	Indicate approriate chemical category	[x] IOCs [ ] VOCs [ ] SOCs		2	0	0	0
(3)	Are IOC, VOC, SOC, Microbial or Radionuclide contaminant sources Present in Zone IA? OR Have SOC/VOC contaminants been detected in the well? OR have IOC contaminants been detected above MCL levels in the well? If Yes, please check the appropriate chemical	( ) Yes	(•) No				
		[ ] IOCs [ ] VOCs [ ] SOCs [ ] Microbials					
			Land Use Subtotal	2	0	0	0

	Zone IB				IOC Score	VOC Score	SOC Score	Microbial Score
(4)	Contaminant Sources Present in Zone IB?	(•) Yes	( ) No					
	Number of Sources in Zone IB in Each Category?		# IOC Sources	4	8	8	8	8
	(List sources by Category up to a Maximum of Four per Category)		# VOC Sources	4				
			# SOC Sources	4				
			# Microbial Sources	4				
(5)	Are there Sources of Class II or III Leachable Contaminants in Zone IB?	(•) Yes	( ) No		IOC Score	VOC Score	SOC Score	Microbial Score
	(List Sources up to a Maximum of Four per Category)		# IOC Sources	4	4	4	4	0
			# VOC Sources	4				
			# SOC Sources	4				
(6)	Does a Group 1 Priority Area Intercept or Group 1 Priority Site Fall Within Zone IB?	( ) Yes	(•) No		0	0	0	0
		[x] IOCs [ ] VOCs [ ] SOCs [ ] Microbials						
(7)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone IB.	Less Than 25% Agricultural Land			0	0	0	0
			Zone IB Subtotal		12	12	12	8

	Zone II			IOC Score	VOC Score	SOC Score	Microbial Score
(9)	Are Contaminant Sources Present in Zone II?	(•) Yes ( ) No	Complete Step 9a				
9a	What types of chemicals?	[x] IOCs [x] VOCs [x] SOCs		2	2	2	0
(10)	Are there Sources of Class II or III Leachable Contaminants in Zone II?	(•) Yes ( ) No	Complete Step 10a				
10a	What type of contaminant?	[x] IOCs [x] VOCs [x] SOCs		1	1	1	0
(11)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone II.	Less Than 25% Agricultural Land		0	0	0	0
		Zone II Subtotal		3	3	3	0

	Zone III			IOC Score	VOC Score	SOC Score	Microbial Score
(12)	Contaminant Sources Present in Zone III?	( ) Yes (•) No	Go to Step 13				
12a	What types of contaminant?	[ ] IOCs [ ] VOCs [ ] SOCs		0	0	0	0
(13)	Are there Sources of Class II or III Leachable Contaminants in Zone III?	( ) Yes (•) No	Go to Step 14				
13a	What types of contaminants?	[ ] IOCs [ ] VOCs [ ] SOCs		0	0	0	0
(14)	Is there Irrigated Agricultural Land That Occupies > 50% of Zone III?	( ) Yes (•) No		0	0	0	0
		Zone III Subtotal		0	0	0	0

	IOC Score	VOC Score	SOC Score	Microbial Score
Community and Non-Community, Non-Transient System Contaminant Source/Land Use Score	17	15	15	8

Final Community/NC-NT System Ranking

IOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

VOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

SOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

Microbial Score = Low Contaminant/Land Use Score (0 to 10 points)

	Public Water System Name:	Hoyt Ranch						Version 2.1
	Public Water System Number:	1280288						5/19/1999
	Well Number:	2						
	Date:	4/9/2004						
	Person Conducting Assessment:	Dennis Owsley						
	Hydrologic Sensitivity Worksheet							
							Value	Comments
(1)	Do the soils belong to drainage classes in the poorly drained through moderately well drained categories?		○ Yes	◉ No			2	According to the PCI, the soils are Moderate to Well drained soils.
(2)	Is the vadose zone composed predominantly of gravel, fractured rock; or is unknown?		◉ Yes	○ No			1	According to the well log, the vadose zone is composed of decomposed granite and granite.
(3)	Is the depth to first groundwater greater than 300 feet?		○ Yes	◉ No			1	According to the well log, the first grond water was encountered at a depth of 175 feet bgs.
(4)	Is an aquitard present with silt/clay or sedimentary interbeds within basalt with greater than 50 feet cumulative thickness?		○ Yes	◉ No			2	According to the well log, this aquitard material is not present.
			Hydrologic Sensitivity Score =				**6**	
	Final Hydrologic Sensitivity Ranking =	High Hydrologic Sensitivity Score (5 to 6 points)						

Public Water System Name:	Hoyt Ranch
Public Water System Number:	1280288
Well Number:	9
Date:	4/9/2004
Person Conducting Assessment:	Dennis Owsley

SWA Susceptibility Rating Sheet

Zone IA Susceptability Rating

Warning: Due to specific conditions found in Zone IA this well has been assigned a High overall susceptability for: None

This rating is based on: (1)The presence of contaminant sources in Zone IA or (2)The detection of specific SOC/VOC chemicals in the well or (3)The detection of specific IOC chemicals above MCL levels in the well.

Public Water Systems may petition IDEQ to revise susceptibility rating based on elimination of contaminant sources or other site-specific factors.

Community and Noncommunity-Nontransient Sources	IOC Score	SOC Score	VOC Score
Hydrologic Sensitivity Score =	4	4	4
Potential Contaminant Source/Land Use Score X 0.20 =	3	3	3
Source Construction Score =	2	2	2
Total	**9**	**9**	**9**

FINAL WELL RANKING

IOC Ranking is Moderate (6 to 12 points)

SOC Ranking is Moderate (6 to 12 points)

VOC Ranking is Moderate (6 to 12 points)

Microbial Susceptability Rating	Score
Hydrologic Sensitivity Score =	4
Potential Contaminant Source/Land Use Score X 0.375 =	3
Source Construction Score =	2
Total	**9**

FINAL WELL RANKING

Microbial Ranking is Moderate (6 to 12 points)

	Public Water System Name:	Hoyt Ranch					Version 2.1
	Public Water System Number:	1280288					5/19/1999
	Well Number:	9					
	Date:	4/9/2004					
	Person Conducting Assessment:	Dennis Owsley					
	Source Construction Worksheet						
							Comments
(1)	Well Drill Date	Input Date	January 8, 2003				
(2)	Well Drillers Log Available?	(•) Yes	( ) No				If no well log is available answers to (4) and (6) are assumed to be NO and points are added to score.
				Year			
(3)	Sanitary Survey Available? If Yes, for what year?	( ) Yes	(•) No	2000			If no sanitary survey is available answer to Questions (5) and (8) is assumed to be NO and points are added to score.
					Value		
(4)	Are current IDWR well construction standards being met?		(•) Yes ( ) No		0		Based on the well log information.
(5)	Is the wellhead and surface seal maintained in good condition?		(•) Yes ( ) No		0		According to a letter from Mr. Remmick, dated August 22, 2003, the wellhead and surface seal conditions meet the requirements of Section 39-118 of the Idaho Code.
(6)	Do the casing and annular seal extend to a low permeability unit?		( ) Yes (•) No		2		According to the well log, the casing extends into granite. The surface seal extends into sand and gravel.
(7)	Is the highest production interval of the well at least 100 feet below the static water level?		(•) Yes ( ) No		0		The highest production interval is located between 295 and 390 feet bgs. The depth to water was 1 foot bgs at the time the well was pump tested.
(8)	Is the well located outside the 100 year floodplain and is it protected from surface runoff?		(•) Yes ( ) No		0		Taken from the PCI and above mentioned letter.
		Source Construction Score =			2		
	Final Source Construction Ranking =	Moderate Source Construction Score (2 to 4 points)					

	Public Water System Name:	Hoyt Ranch		Version 2.1			
	Public Water System Number:	1280288		5/19/1999			
	Well Number:	9					
	Date:	4/9/2004					
	Person Conducting Assessment:	Dennis Owsley					

Potential Contaminant Source/Land Use Worksheet

	Land Use/Zone IA			IOC Score	VOC Score	SOC Score	Microbial Score
(1)	Land Use (Pick the Predominant Land Type)	Rangeland, Woodland, Basalt		0	0	0	0
(2)	Is Farm Chemical Use High or Unknown? (Answer No if (1) = Urban/Commercial)	(•) Yes	( ) No	Complete Step 2a			
2a	Indicate approriate chemical category	[x] IOCs [ ] VOCs [ ] SOCs		2	0	0	0
(3)	Are IOC, VOC, SOC, Microbial or Radionuclide contaminant sources Present in Zone IA? OR Have SOC/VOC contaminants been detected in the well? OR have IOC contaminants been detected above MCL levels in the well? If Yes, please check the appropriate chemical	( ) Yes	(•) No				
		[ ] IOCs [ ] VOCs [ ] SOCs [ ] Microbials					
			Land Use Subtotal	2	0	0	0

	Zone IB				IOC Score	VOC Score	SOC Score	Microbial Score
(4)	Contaminant Sources Present in Zone IB?	(•) Yes	( ) No					
	Number of Sources in Zone IB in Each Category?		# IOC Sources	4	8	8	8	8
	(List sources by Category up to a Maximum of Four per Category)		# VOC Sources	4				
			# SOC Sources	4				
			# Microbial Sources	4				
(5)	Are there Sources of Class II or III Leachable Contaminants in Zone IB?	(•) Yes	( ) No		IOC Score	VOC Score	SOC Score	Microbial Score
	(List Sources up to a Maximum of Four per Category)		# IOC Sources	4	4	4	4	0
			# VOC Sources	4				
			# SOC Sources	4				
(6)	Does a Group 1 Priority Area Intercept or Group 1 Priority Site Fall Within Zone IB?	( ) Yes	(•) No		0	0	0	0
		[x] IOCs [ ] VOCs [ ] SOCs [ ] Microbials						
(7)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone IB.	Less Than 25% Agricultural Land			0	0	0	0
			Zone IB Subtotal		12	12	12	8

	Zone II			IOC Score	VOC Score	SOC Score	Microbial Score
(9)	Are Contaminant Sources Present in Zone II?	◉ Yes ○ No	Complete Step 9a				
9a	What types of chemicals?	☑ IOCs ☑ VOCs ☑ SOCs		2	2	2	0
(10)	Are there Sources of Class II or III Leachable Contaminants in Zone II?	◉ Yes ○ No	Complete Step 10a				
10a	What type of contaminant?	☑ IOCs ☑ VOCs ☑ SOCs		1	1	1	0
(11)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone II.	Less Than 25% Agricultural Land		0	0	0	0
		Zone II Subtotal		3	3	3	0

	Zone III			IOC Score	VOC Score	SOC Score	Microbial Score
(12)	Contaminant Sources Present in Zone III?	○ Yes ◉ No	Go to Step 13				
12a	What types of contaminant?	☐ IOCs ☐ VOCs ☐ SOCs		0	0	0	0
(13)	Are there Sources of Class II or III Leachable Contaminants in Zone III?	○ Yes ◉ No	Go to Step 14				
13a	What types of contaminants?	☐ IOCs ☐ VOCs ☐ SOCs		0	0	0	0
(14)	Is there Irrigated Agricultural Land That Occupies > 50% of Zone III?	○ Yes ◉ No		0	0	0	0
		Zone III Subtotal		0	0	0	0

	IOC Score	VOC Score	SOC Score	Microbial Score
Community and Non-Community, Non-Transient System Contaminant Source/Land Use Score	17	15	15	8

Final Community/NC-NT System Ranking

IOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

VOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

SOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

Microbial Score = Low Contaminant/Land Use Score (0 to 10 points)

	Public Water System Name:	Hoyt Ranch						Version 2.1
	Public Water System Number:	1280288						5/19/1999
	Well Number:	9						
	Date:	4/9/2004						
	Person Conducting Assessment:	Dennis Owsley						
	Hydrologic Sensitivity Worksheet							
							Value	Comments
(1)	Do the soils belong to drainage classes in the poorly drained through moderately well drained categories?		○ Yes	◉ No			2	Accoridng to the PCI, the soils are rated as moderate to well drained soils.
(2)	Is the vadose zone composed predominantly of gravel, fractured rock; or is unknown?		◉ Yes	○ No			1	Sand, gravel, granite and clay compose the vadose zone according to the well log.
(3)	Is the depth to first groundwater greater than 300 feet?		○ Yes	◉ No			1	The first ground water was encountered at 102 feet bgs, according to the well log.
(4)	Is an aquitard present with silt/clay or sedimentary interbeds within basalt with greater than 50 feet cumulative thickness?		◉ Yes	○ No			0	According to the well log, the zone between 26 and 78 feet bgs is composed of clay.
			Hydrologic Sensitivity Score =				**4**	
	Final Hydrologic Sensitivity Ranking =	Moderate Hydrologic Sensitivity Score (2 to 4 points)						

Public Water System Name:	Hoyt Ranch				Version 2.1
Public Water System Number:	1280288				5/19/1999
Well Number:	10				
Date:	4/9/2004				
Person Conducting Assessment:	Dennis Owsley				

SWA Susceptibility Rating Sheet

Zone IA Susceptability Rating					**Rationale for High Susceptability in Zone IA**
Warning: Due to specific conditions found in Zone IA this well has been assigned a High overall susceptability for:	Microbials				Due to the detection of microbial contaminants at the well head on 7/8/03, the rating of microbial sucsceptability is high for this well.
This rating is based on: (1)The presence of contaminant sources in Zone IA or (2)The detection of specific SOC/VOC chemicals in the well or (3)The detection of specific IOC chemicals above MCL levels in the well.					
Public Water Systems may petition IDEQ to revise susceptibility rating based on elimination of contaminant sources or other site-specific factors.					

Community and Noncommunity-Nontransient Sources		**IOC Score**	**SOC Score**	**VOC Score**	**Comments**
Hydrologic Sensitivity Score =		6	6	6	
Potential Contaminant Source/Land Use Score X 0.20 =		3	3	3	
Source Construction Score =		2	2	2	
Total		**11**	**11**	**11**	
FINAL WELL RANKING					
IOC Ranking is Moderate (6 to 12 points)					
SOC Ranking is Moderate (6 to 12 points)					
VOC Ranking is Moderate (6 to 12 points)					

Microbial Susceptability Rating		**Score**
Hydrologic Sensitivity Score =		6
Potential Contaminant Source/Land Use Score X 0.375 =		4
Source Construction Score =		2
Total		**12**
FINAL WELL RANKING		
Microbial Ranking is High		

	Public Water System Name:	Hoyt Ranch					Version 2.1
	Public Water System Number:	1280288					5/19/1999
	Well Number:	10					
	Date:	4/9/2004					
	Person Conducting Assessment:	Dennis Owsley					
	Source Construction Worksheet						
							Comments
(1)	Well Drill Date	Input Date	March 23, 2003				
(2)	Well Drillers Log Available?	(•) Yes	( ) No				If no well log is available answers to (4) and (6) are assumed to be NO and points are added to score.
				Year			
(3)	Sanitary Survey Available? If Yes, for what year?	( ) Yes	(•) No	2000			If no sanitary survey is available answer to Questions (5) and (8) is assumed to be NO and points are added to score.
					Value		
(4)	Are current IDWR well construction standards being met?		(•) Yes ( ) No		0		Taken from well log information.
(5)	Is the wellhead and surface seal maintained in good condition?		(•) Yes ( ) No		0		According to a letter from Mr. Remmick, dated August 22, 2003, the wellhead and surface seal conditions meet the requirements of Section 39-118 of the Idaho Code.
(6)	Do the casing and annular seal extend to a low permeability unit?		( ) Yes (•) No		2		The surface seal extends into a sand and gravel unit, at a depth of 24 feet bgs, according to the well log.
(7)	Is the highest production interval of the well at least 100 feet below the static water level?		(•) Yes ( ) No		0		The highest production interval is between 365 to 380 feet bgs, whereas the static water level is at 95 feet bgs, according to the well log.
(8)	Is the well located outside the 100 year floodplain and is it protected from surface runoff?		(•) Yes ( ) No		0		Taken from above mentioned letter and the PCI.
		Source Construction Score =			2		
	Final Source Construction Ranking =	Moderate Source Construction Score (2 to 4 points)					

Public Water System Name:	Hoyt Ranch			Version 2.1			
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Person Conducting Assessment:	Dennis Owsley						

Potential Contaminant Source/Land Use Worksheet

	Land Use/Zone IA				IOC Score	VOC Score	SOC Score	Microbial Score
(1)	Land Use (Pick the Predominant Land Type)	Rangeland, Woodland, Basalt			0	0	0	0
(2)	Is Farm Chemical Use High or Unknown? (Answer No if (1) = Urban/Commercial)	(•) Yes	( ) No		**Complete Step 2a**			
2a	Indicate approriate chemical category	[x] IOCs [ ] VOCs [ ] SOCs			2	0	0	0
(3)	Are IOC, VOC, SOC, Microbial or Radionuclide contaminant sources Present in Zone IA? OR Have SOC/VOC contaminants been detected in the well? OR have IOC contaminants been detected above MCL levels in the well? If Yes, please check the appropriate chemical	(•) Yes	( ) No					
		[ ] IOCs [ ] VOCs [ ] SOCs [x] Microbials						
				Land Use Subtotal	2	0	0	0

	Zone IB							
(4)	Contaminant Sources Present in Zone IB?	(•) Yes	( ) No					
					IOC Score	VOC Score	SOC Score	Microbial Score
	Number of Sources in Zone IB in Each Category?		**# IOC Sources**	4	8	8	8	8
	(List sources by Category up to a Maximum of Four per Category)		**# VOC Sources**	4				
			# SOC Sources	4				
			# Microbial Sources	4				
(5)	Are there Sources of Class II or III Leachable Contaminants in Zone IB?	(•) Yes	( ) No					
					IOC Score	VOC Score	SOC Score	Microbial Score
	(List Sources up to a Maximum of Four per Category)		**# IOC Sources**	4	4	4	4	0
			# VOC Sources	4				
			# SOC Sources	4				
(6)	Does a Group 1 Priority Area Intercept or Group 1 Priority Site Fall Within Zone IB?	(•) Yes	( ) No		0	0	0	2
		[ ] IOCs [ ] VOCs [ ] SOCs [x] Microbials						
(7)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone IB.	Less Than 25% Agricultural Land			0	0	0	0
				Zone IB Subtotal	12	12	12	10

	Zone II			IOC Score	VOC Score	SOC Score	Microbial Score
(9)	Are Contaminant Sources Present in Zone II?	◉ Yes ○ No	Complete Step 9a				
9a	What types of chemicals?	☑ IOCs ☑ VOCs ☑ SOCs		2	2	2	0
(10)	Are there Sources of Class II or III Leachable Contaminants in Zone II?	◉ Yes ○ No	Complete Step 10a				
10a	What type of contaminant?	☑ IOCs ☑ VOCs ☑ SOCs		1	1	1	0
(11)	Pick the Best Description of the Amount and Type of Agricultural Land in Zone II.	Less Than 25% Agricultural Land		0	0	0	0
		Zone II Subtotal		3	3	3	0

	Zone III			IOC Score	VOC Score	SOC Score	Microbial Score
(12)	Contaminant Sources Present in Zone III?	○ Yes ◉ No	Go to Step 13				
12a	What types of contaminant?	☐ IOCs ☐ VOCs ☐ SOCs		0	0	0	0
(13)	Are there Sources of Class II or III Leachable Contaminants in Zone III?	○ Yes ◉ No	Go to Step 14				
13a	What types of contaminants?	☐ IOCs ☐ VOCs ☐ SOCs		0	0	0	0
(14)	Is there Irrigated Agricultural Land That Occupies > 50% of Zone III?	○ Yes ◉ No		0	0	0	0
		Zone III Subtotal		0	0	0	0

	IOC Score	VOC Score	SOC Score	Microbial Score
Community and Non-Community, Non-Transient System Contaminant Source/Land Use Score	17	15	15	10

Final Community/NC-NT System Ranking

IOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

VOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

SOC Score = Moderate Contaminant/Land Use Score (11 to 20 points)

Microbial Score = High Contaminant/Land Use Score

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	Hydrologic Sensitivity Worksheet							
							Value	Comments
(1)	Do the soils belong to drainage classes in the poorly drained through moderately well drained categories?		○ Yes	◉ No			2	According to the PCI, the soils are rated as moderate to well drained soils.
(2)	Is the vadose zone composed predominantly of gravel, fractured rock; or is unknown?		◉ Yes	○ No			1	According to the well log, the vadose zone is composed of sand, gravel, and clay (predominantly sand and gravel).
(3)	Is the depth to first groundwater greater than 300 feet?		○ Yes	◉ No			1	The first ground water was encountered at 97 feet.
(4)	Is an aquitard present with silt/clay or sedimentary interbeds within basalt with greater than 50 feet cumulative thickness?		○ Yes	◉ No			2	According to the well log, this aquitard material is not present.
			Hydrologic Sensitivity Score =				**6**	
	Final Hydrologic Sensitivity Ranking =	High Hydrologic Sensitivity Score (5 to 6 points)						